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Air Products

Industrial Gas Division

Acetylene Material Safety Data Sheet

DPM 149

EMERGENCY PHONE: 800—523-9374 IN PENNSYLVANIA: 800—322-9092	TRADE NAME AND SYNONYMS Acetylene, Ethyne, Ethine	CHEMICAL NAME AND SYNONYMS Acetylene, Ethyne, Ethine
ISSUE DATE AND REVISIONS Issued: 31 January 1978 Rev: 13 February 1981	FORMULA C_2H_2 MW:26.04	CHEMICAL FAMILY Alkynes

HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE
Acetylene is classified as a simple asphyxiant and has no threshold limit value (TLV).

SYMPTOMS IF INGESTED, CONTACTED WITH SKIN, OR VAPOR INHALED
Symptoms such as headaches, dizziness, shortness of breath, and loss of consciousness may occur if the gas is present in quantities sufficient to dilute the oxygen concentration in air. Symptoms of anoxia occur only when the gas concentrations are within the flammable range and the mixture has not ignited. (DO NOT ENTER AREAS WITHIN THE FLAMMABLE RANGE DUE TO THE IMMEDIATE FIRE AND EXPLOSION HAZARD.) Use a suitable flammable gas meter (explosimeter) calibrated for acetylene to measure concentrations of gas in the air.

TOXICOLOGICAL PROPERTIES
Acetylene is a simple asphyxiant, irritant, and anesthetic. About 100 mg per liter may be tolerated for 0.5—1.0 hour. There is no experimental evidence of chronic harmful effects.

RECOMMENDED FIRST AID TREATMENT
First degree and minor second degree thermal burns from fires should be immersed in cool water for 30 minutes. Major second and third degree burns should be covered in the cleanest material available. Seek immediate aid of a physician. Persons suffering from lack of oxygen should be moved to areas with normal atmosphere. Assisted respiration and supplemental oxygen should be given if the victim is not breathing.

FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	AUTO IGNITION TEMP	FLAMMABLE LIMITS	LEL	UEL
OF (-18C) (CC)	581F (305C)	In air @ 1 atm	2.5%	100%

EXTINGUISHING MEDIA	ELECTRICAL CLASSIFICATION
Carbon dioxide, dry chemical, Halon	GROUP Class 1, Group A

SPECIAL FIRE FIGHTING PROCEDURES
Stop gas flow and fight fire conventionally. Use water spray to keep cylinders or other containers cool if exposed to fire. Keep personnel well away since containers can rupture violently when exposed to fire. For additional information, see Compressed Gas Association Safety Bulletin SB-4.

UNUSUAL FIRE AND EXPLOSION HAZARDS
ACETYLENE IS EXTREMELY FLAMMABLE AND EXPLOSIVE. IT MAY DECOMPOSE VIOLENTLY IN ITS FREE STATE UNDER PRESSURE IN EXCESS OF 15 PSIG. It burns with an intensely hot flame. Potential explosion hazard exists from reignition if fire is extinguished without shutting off acetylene source. Ignites very easily due to low minimum ignition energy; very wide flammable limits. Acetylene gas has an approximate specific gravity of 1.0 and tends to stay in pockets rather than dissipate.

PHYSICAL DATA

BOILING POINT (°F.)	FREEZING POINT (°F.)
@ 1 atm -119.2F (-84.0C)	@1 atm -113.4F (-80.8C)
VAPOR PRESSURE (psia)	SOLUBILITY IN WATER
@ 62.2F (16.8C) 590 psia (40 atm)	@ 64F (18C), 1 atm 1.0 CuFt/CuFtH_2O

VAPOR DENSITY (lb/cu ft)	SPECIFIC GRAVITY (AIR = 1)	LIQUID DENSITY (lb/cu ft)	SPECIFIC GRAVITY (H_2O = 1)
@ 68F (20C), 1 atm 0.0681	@ 68F (20C), 1 atm 0.906	@ -116F (-82C), 1 atm 38.76	@ -116F (-82C), 1 atm 0.621

APPEARANCE AND ODOR
Pure acetylene is colorless and odorless. Impurities in carbide generated acetylene impart a characteristic garlic-like odor.

DISCLAIMER

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REACTIVITY DATA

STABILITY			CONDITIONS TO AVOID
	UNSTABLE	X	Never utilize free gas outside the cylinder at pressures in excess of 15 psig. Avoid mechanical shocks to containers of acetylene. Never expose cylinders or acetylene systems to sources of heat.
	STABLE		

INCOMPATIBILITY (Materials to avoid)
Oxidizers such as oxygen, and halogens. Forms explosive compounds with copper, brass, copper salts, Hg Hg salts, K, Ag and Ag salts, and HNO_3.

HAZARDOUS DECOMPOSITION PRODUCTS
Acetylene will decompose into elemental carbon and hydrogen under the above conditions.

HAZARDOUS POLYMERIZATION			CONDITIONS TO AVOID
	MAY OCCUR		
	WILL NOT OCCUR	X	

SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Ventilate area to prevent flammable mixture from forming. Remove sources of ignition, heat, sparks, etc. Avoid entering area of flammable atmosphere. Carefully remove cylinders with slow leaks to a remote outdoor location. Contact Air Products for assistance.

WASTE DISPOSAL METHOD
Do not attempt to dispose of residual gaseous acetylene in cylinders. Return to Air Products for disposal.

SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type)
Oxygen-deficient atmospheres are in the flammable range. DO NOT ENTER. Respirators will not function.

VENTILATION		
Natural or mechanical where gas is present.	LOCAL EXHAUST	SPECIAL Mechanical ventilation for enclosed storage areas must meet National Electrical Code requirements for Class 1, Group A
	MECHANICAL (General)	OTHER

PROTECTIVE GLOVES
Ordinary leather work gloves recommended for cylinder handling. Welders gloves required for cutting and welding operations.

EYE PROTECTION
Safety glasses recommended for handling cylinders. Welders goggles, etc., required for cutting and welding.

OTHER PROTECTIVE EQUIPMENT
Leather sleeves, leather apron and other standard protective equipment for cutting and welding.

SPECIAL PRECAUTIONS*

SPECIAL LABELING INFORMATION
Acetylene shipments must be in accordance with Department of Transportation (DOT) regulations using the DOT 'FLAMMABLE GAS" label. Consult DOT regulations for details on the shipping of hazardous materials.

SPECIAL HANDLING RECOMMENDATIONS
Use only in well ventilated areas. Acetylene gas cylinders contain gas at high pressure and should be handled with care. Use a pressure-reducing regulator set at less than 15 psig. Always keep acetylene cylinders upright and secure cylinders when in use. Never expose an acetylene cylinder to heat. Always open and close acetylene valves slowly. Return cylinders to Air Products with positive pressure and cylinder valve closed. Avoid dragging, rolling, or sliding cylinders, even for a short distance. Use a suitable hand truck. For additional handling recommendations on compressed gas cylinders, consult Compressed Gas Association Pamphlet P-1.

SPECIAL STORAGE RECOMMENDATIONS
Storage of 2500 cubic feet or less is permissible within buildings. Storage in excess of 2500 cubic feet must be out doors or in well ventilated special rooms or buildings. Keep cylinders away from sources of heat. Storage should not be in heavy traffic areas to prevent accidental knocking over or damge from passing or falling objects. Valve caps should remain on cylinders not connected for use. Segregate full and empty cylinders. Keep acetylene cylinders storage areas away from storage of oxygen and other oxidizers. Storage areas should be free of combustible material. Avoid exposure to areas where salt or other corrosive chemicals are present. Store acetylene cylinders with the valve end up. See Compressed Gas Association Pamphlet P-1 and National Fire Protection Association Standard No. 51 for additional storage recommendations.

SPECIAL PACKAGING RECOMMENDATIONS
Acetylene is packaged in cylinders meeting DOT specification 8 or 8AL. The cylinder contains a porous filler saturated with acetone. The acetylene stored in the cylinder is dissolved in acetone. A full cylinder should not exceed 250 psig @ 70F.

OTHER RECOMMENDATIONS OR PRECAUTIONS
Acetylene cylinders should be stored and used in an upright position. When using acetylene, close the cylinder valve before shutting off the regulator to permit the gas to bleed from the regulator. Avoid hazardous mixtures and sources of ignition. Formation of explosive copper acetylides can be avoided by using copper alloys proved successful through use in industry. Compressed gas cylinders should not be refilled except by qualified producers of compressed gases. Shipment of a compressed gas cylinder filled without the permission of the owner is a violation of Federal Law.

*Various Government agencies (i.e., Department of Transportation, Occupational Safety and Health Administration, Food and Drug Administration and others) may have specific regulations concerning the transportation handling, storage or use of this product which will not be reflected in this data sheet. The customer should review these regulations to ensure that he is in full compliance.